REMARKS

Applicants concurrently file herewith and Excess Claim Fee Payment Letter, and corresponding excess claim fee, for nineteen (19) excess total claims.

As a preliminary matter, regarding the Examiner's Response to Arguments, Applicants respectfully submit that the Examiner has clearly mischaracterized Applicants' arguments. Specifically, the Examiner stated that "the Examiner interprets Applicant's argument to be that none of the prior art references alone teaches the transparent electrode in combination with the reflective layer. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references" (see Office Action at page 4).

Applicants respectfully disagree with the Examiner's interpretation of Applicants' arguments. Specifically, Applicants did not argue the references individually. In contrast, Applicants clearly argued that the combination of references did not teach or suggest a transparent electrode disposed above said single reflective layer. That is, Applicants stated that "neither Soules, Butterworth, Tsutsui nor Nakamura, nor any combination thereof teaches or suggests *'a transparent electrode disposed above said single reflective layer'* as recited in independent claim 1, and similarly recited in independent claims 11, 21 and 42 (see Amendment filed May 25, 2004 at page 16) (emphasis Applicants').

Claims 1-3, 6-13, 16-22, 25-28, 30-34, 38-46 and 49-85 are all of the claims presently pending in the application. Claims 1, 11, 21, 42, 49 and 63-66 have been amended to more particularly define the invention. Claims 67-85 have been added to provide more varied protection for the claimed invention and to claim additional features of the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-3, 6-10, 21, 22, 26-28, 30-34, 38, 40-42, 59, 61 and 62 stand rejected under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 6,252,254 to Soules et al. (hereinafter "Soules"), in view of U.S. Patent No. 5,847,507 to Butterworth et al. (hereinafter "Butterworth"), U.S. Patent No. 5,798,536 to Tsutsui, and U.S. Patent No. 5,877,558 to Nakamura et al. (hereinafter "Nakamura"). Claims 11-13, 16-20, 39 and 60 stand rejected under 35 U.S.C. §103(a) as unpatentable over Soules, Butterworth, Tsutsui, and Nakamura as applied to the claims above, and further in view of U.S. Patent No. 6,153,123 to Hampden-Smith et al. (hereinafter "Hampden-Smith"). Claim 25 stands rejected under 35 U.S.C. §103(a) as unpatentable over Soules, Butterworth, Tsutsui, and Nakamura as applied to the claims above, and further in view of U.S. Patent No. 6,166,489 to Thompson et al. (hereinafter "Thompson"). Claims 46, 49, and 50 stands rejected under 35 U.S.C. §103(a) as unpatentable over Soules, Butterworth, Tsutsui, and Nakamura as applied to the claims above, and further in view of U.S. Patent No. 6,340,824 to Komoto et al. (hereinafter "Komoto"). Claims 43-45 stand rejected under 35 U.S.C. §103(a) as unpatentable over Soules, Butterworth, Tsutsui, and Nakamura as applied to the claims above, and further in view of U.S. Patent No.5,998,925 to Shimizu et al. (hereinafter "Shimizu"). Claims 51-58 stand rejected under 35 U.S.C. §103(a) as unpatentable over Soules, Butterworth, Tsutsui, and Nakamura as applied to the claims above, and further in view of U.S. Patent No. 6,335,217 to Chiyo et al. (hereinafter "Chiyo"). Claims 63-66 stand

rejected under 35 U.S.C.§103(a) as unpatentable over Soules, Butterworth, Tsutsui, and Nakamura as applied to the claims above, and further in view of Shimizu.

These rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., as defined by exemplary claim 1) is directed to a light-emitting apparatus that includes a primary light source including a GaN semiconductor light-emitting device that emits a first light of a wavelength of 380 nm to 500 nm, the GaN semiconductor light-emitting device including a single reflective layer, and a transparent electrode disposed above the single reflective layer, and a leadframe including a cup portion including a bottom surface on which the GaN semiconductor light-emitting device is mounted, a secondary light source including a fluorescent material that includes at least one of ZnS:Cu, Au, Al; ZnS:Cu, Al; ZnS:Cu; and Y_2O_2S:Ce, and a fluorescent material resin, the fluorescent material being dispersed within the fluorescent material resin, and the fluorescent material resin being contained in the cup portion, a sealing member that focuses light emitted from the light-emitting apparatus, the sealing member being disposed above the secondary light source, and an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler, and wherein the fluorescent material absorbs the first light of a first wavelength and emits a second light of a second wavelength, which is greater than the first wavelength.

Conventional light-emitting apparatus can emit white light by using a blue-light-emitting diode and a flourescent material of photoluminescence in combination. An yttrium-aluminum-garnet flourescent material may be activated by cerium (Ce) to absorb light emitted

from the blue light-emitting diode and emit yellow light. The blue light emitted from the light-emitting diode and the yellow light emitted from the flourescent material are mixed together to generate white light.

The claimed invention of exemplary claim 1, on the other hand, provides a light-emitting apparatus that includes a primary light source including a GaN semiconductor light-emitting device that emits a first light of a wavelength of substantially the entire range of 380nm to 500 nm (see Application at page 3, lines 9-13), the GaN semiconductor light-emitting device including a single reflective layer (e.g., see Application at page 22, line 25 through page 23, line 6), and a transparent electrode disposed above the single reflective layer, and a leadframe including a cup portion including a bottom surface on which the GaN semiconductor light-emitting device is mounted, a secondary light source including a fluorescent material that includes at least one of ZnS:Cu, Au, Al; ZnS:Cu, Al; ZnS:Cu; and Y_2O_2S:Ce, and a fluorescent material resin, the fluorescent material being dispersed within the fluorescent material resin, and the fluorescent material resin being contained in the cup portion, and a sealing member that focuses light emitted from the light-emitting apparatus, the sealing member being disposed above the secondary light source, wherein the fluorescent material absorbs the first light of a first wavelength and emits a second light of a second wavelength, which is greater than the first wavelength (e.g., see Application at page 2, lines 13-25). Because a fluorescent material excited efficiently by light with an emission wavelength of from 380 nm to 500 nm to thereby emit light is used as the fluorescent material, a light-emitting apparatus of high luminance and high efficiency is obtained (see Application at page 3, lines 9-13).

Furthermore, the claimed invention of exemplary claim 1 provides a light-emitting

apparatus that includes a primary light source including an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler (e.g., see Application at page 24, lines 11-16). This combination of features prevents boundary separation between the light-emitting device and the adhesive agent.

II. INDEFINITENESS REJECTION

Claim 49 stands rejected under 35 U.S.C. §112, second paragraph. Claim 49 has been amended to overcome this rejection.

Specifically, claim 49 has been amended to recite "a flourescent material layer disposed above said sealing member and absorbs said first light of a first wavelength and emits a second light of a second wavelength, which is greater than said first wavelength, said fluorescent material layer comprising a fluorescent material dispersed therein". The fluorescent material (36) is dispersed in a fluorescent material layer (710) which is disposed above the sealing resin (50) as shown in Figure 12 of the Application.

Therefore, Applicants respectfully submit that claim 49 is not indefinite.

III. THE PRIOR ART REFERENCES

A. The Soules Reference

Applicants submit that there are elements of the claimed invention that are not taught or suggested by Soules.

That is, Soules does not teach or suggest "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent

claims 11, 21, 42 and 63-66.

As noted above, the inventive light-emitting apparatus includes a primary light source including a GaN semiconductor light-emitting device that emits a first light of a wavelength of substantially the entire range of 380nm to 500 nm (see Application at page 3, lines 9-13). Because a fluorescent material excited efficiently by light with an emission wavelength of from 380 nm to 500 nm to thereby emit light is used as the fluorescent material, a light-emitting apparatus of high luminance and high efficiency is obtained (see Application at page 3, lines 9-13).

The novel combination of features of the claimed invention is not taught or suggested by Soules. The Examiner attempts to rely on column 3, lines 57-60 of Soules to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in this passage (nor anywhere else for that matter) does Soules teach or suggest a primary light source including a GaN semiconductor light-emitting device that emits a first light of a wavelength of substantially the entire range of 380nm to 500 nm. Indeed, the Examiner merely states that Soules teaches LEDs or laser diodes that emit primary, blue light in the range of 420nm-470nm. The LED is covered with a phosphor-containing polymer layer (15) and a clear polymer lens (16), and both of these materials may be composed of the same material, such as silicone.

Applicants submit that the "[t]he law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims" (see MPEP 2144.05). The specific range recited in the claimed invention is an important feature to the invention. That is, Applicants have discovered that because a fluorescent material exited efficiently by light with an emission wavelength of from 380 nm

to 500 nm to thereby emit light is used as the fluorescent material, a light-emitting apparatus of high luminance and high efficiency is obtained (see Application at page 3, lines 9-13). Applicants have discovered a specific wavelength range that is important for providing specific features to the claimed invention. This specific claimed feature is not taught or suggested by Soules.

Additionally, Applicants submit that Soules does not teach or suggest *"wherein said multiple quantum well structure comprises well layers comprised of InGaN"* as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66. Indeed, the Examiner does not even allege that Soules teaches or suggests this feature.

Furthermore, Soules does not teach or suggest *"an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler"* as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The Examiner attempts to rely on column 3, lines 57-60 of Soules to support his allegations. The Examiner is clearly incorrect.

That is, nowhere in this passage (nor anywhere else) does Soules teach or suggest an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler.

Indeed, in Soules the LED is covered with a phosphor-containing polymer layer (15) and clear polymer lens (16), and both of these materials may be composed of the same material, such as silicone.

In contrast, in accordance with an exemplary aspect of the claimed invention, a light-emitting device is mounted onto a cup portion through the adhesive agent (or layer) including

the filler (see Application at page 24, lines 11 through 16). Since the adhesive agent (or layer) includes the filler, a thermal expansion coefficient can be incorporated into the light-emitting device. Thus, boundary separation between the light-emitting device and the adhesive agent (or layer) can be prevented.

B. The Butterworth Reference

Applicants submit that there are elements of the claimed invention that are not taught or suggested by Butterworth.

That is, Butterworth does not teach or suggest "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Butterworth. Indeed, the Examiner does not even allege that Butterworth teaches or suggests a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. The Examiner merely relies upon Butterworth as teaching that a flourescent-material-containing resin may be contained in the cup portion of a cup-shaped lead frame with a transparent resin sealing member formed thereabove.

Butterworth merely discloses a white LED 100 that includes a blue emitting gallium nitride (GaN) die 110 mounted on a reflector cup lead frame 120 (col. 1, lines 31-35). A blob of cerium (Ce) activated yttrium aluminum garnet (YAG) phosphor 130 is placed on top of the LED die 110 (col. 1, lines 36-38).

Additionally, Applicants submit that Butterworth does not teach or suggest "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, Butterworth does not teach or suggest "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Butterworth. Indeed, the Examiner does not even allege that Butterworth teaches or suggests an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. The Examiner merely relies upon Butterworth as teaching that a flourescent-material-containing resin may be contained in the cup portion of a cup-shaped lead frame with a transparent resin sealing member formed thereabove.

Again, Butterworth merely discloses a white LED 100 that includes a blue emitting gallium nitride (GaN) die 110 mounted on a reflector cup lead frame 120 (col. 1, lines 31-35). A blob of cerium (Ce) activated yttrium aluminum garnet (YAG) phosphor 130 is placed on top of the LED die 110 (col. 1, lines 36-38).

In contrast, in accordance with an exemplary aspect of the claimed invention, a light-emitting device is mounted onto a cup portion through the adhesive agent (or layer) including the filler (see Application at page 24, lines 11 through 16). Since the adhesive agent (or layer) includes the filler, thermal expansion coefficient can be incorporated into the light-emitting device. Thus, boundary separation between the light-emitting device and the

adhesive agent (or layer) can be prevented.

C. The Tsutsui Reference

Applicants submit that there are elements of the claimed invention that are not taught or suggested by Tsutsui.

That is, Tsutsui does not teach or suggest "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Tsutsui. Indeed, the Examiner does not even allege that Tsutsui teaches or suggests a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. The Examiner merely relies upon Tsutsui as teaching a GaN emitter formed on a sapphire substrate and for teaching that the GaN chip may further possess a light reflection film 11 on the rear side of the sapphire substrate for reflecting light that is directed toward the substrate and back toward the front, upper light emission surface.

Additionally, Applicants submit that Tsutsui does not teach or suggest "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, Tsutsui does not teach or suggest "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as recited in independent claim 1, and similarly recited in independent claims 11, 21,

42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Tsutsui. Indeed, the Examiner does not even allege that Tsutsui teaches or suggests an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler.

In contrast, in accordance with an exemplary aspect of the claimed invention, a light-emitting device is mounted onto a cup portion through the adhesive agent (or layer) including the filler (see Application at page 24, lines 11 through 16). Since the adhesive agent (or layer) includes the filler, thermal expansion coefficient can be incorporated into the light-emitting device. Thus, boundary separation between the light-emitting device and the adhesive agent (or layer) can be prevented.

D. The Nakamura Reference

The Examiner alleges that Nakamura would have been combined with Soules, Butterworth and Tsutsui to teach the claimed invention of claims 1-3, 6-10, 21, 22, 26-28, 30-34, 38, 40-42, 59, 61 and 62. Applicants submit, however, that these references would not have been combined, and that, even if combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, the Examiner's motivation to modify Soules, Butterworth and Tsutsui ("to increase ohmic contact and improve current spreading through the p-type semiconductor layers") does not appear to be a problem in Soules, Butterworth and Tsutsui that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". "The mere fact that references can be combined or modified does not render the

resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis added in MPEP).

Moreover, neither Soules, Butterworth, Tsutsui nor Nakamura, nor any combination thereof, teaches or suggests "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Nakamura. Indeed, the Examiner merely attempts to rely on the light transmitting electrode (15) of Namkaura as teaching the transparent electrode of the claimed invention.

Nowhere, however, in this passage (nor anywhere else for that matter) does Nakamura teach or suggest a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Indeed, the Examiner does not even allege that Nakamura teaches or suggests this feature. In fact, the Examiner merely relies upon Nakamura as teaching a light-transmitting electrode. Therefore, Nakamura does not make up for the deficiencies of Soules, Butterworth and Tsutsui.

Additionally, Applicants submit that neither Soules, Butterworth, Tsutsui nor Nakamura, nor any combination thereof, teaches or suggests "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, neither Soules, Butterworth, Tsutsui nor Nakamura, nor any combination thereof teaches or suggests "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as

recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Nakamura. Indeed, the Examiner attempts to rely on column 30, line 41 of Nakamura to support his allegations. The Examiner, however, is clearly incorrect.

Nakamura merely discloses a GaN-based LED formed on various substrates such as sapphire, wherein a light transmitting electrode (15) is formed above the p-side semiconductor layer. Nakamura states that "light-transmitting" means that the electrode transmits at least 1% of the light emitted from the gallium nitride-based III-V Group compound semiconductor light-emitting device therethrough, and does not necessarily mean colorless or transparent. Nakamura further states that a light-transmitting electrode usually transmits 20%-40% of the light emitted from the device therethrough (Nakamura at column 4, lines 55-64).

Nowhere, however, in this passage (nor anywhere else for that matter) does Nakamura teach or suggest an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. Indeed, the Examiner does not even allege that Nakamura teaches or suggests this feature. In fact, the Examiner merely relies upon Nakamura as teaching a light-transmitting electrode. Therefore, Nakamara does not make up for the deficiencies of Soules, Butterworth and Tsutsui.

Therefore, Applicants submit that these references, even if combined, would not teach or suggest each and every element of the claimed invention. Therefore the Examiner is respectfully requested to withdraw this rejection.

E. The Hampden-Smith Reference

The Examiner alleges that Hampden-Smith would have been combined with Soules, Butterworth, Tsutsui and Nakamura to teach the claimed invention of claims 11-13, 16-20, 39 and 60. Applicants submit, however, that these references would not have been combined, and that even if combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, the Examiner's motivation to modify Soules, Butterworth, Tsutsui and Nakamura ("(1) to obtain the particular hue associated with the specific phosphor or (2) for business reasons such as relating to the cost and availability of a particular phosphor") does not appear to be a problem in Soules, Butterworth, Tsutsui and Nakamura that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis added in MPEP).

Moreover, neither Soules, Butterworth, Tsutsui, Nakamura nor Hampden-Smith, nor any combination thereof, teaches or suggests "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Hampden-Smith. Indeed, the Examiner merely attempts to rely on Hampden-Smith as allegedly teaching various sulfur-containing phosphors that can be used in an array of applications including photoluminescence. The Examiner relies upon columns 35-37 of

Hampden-Smith to support his allegations.

Nowhere, however, in this passage (nor anywhere else for that matter) does Hampden-Smith teach or suggest a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Indeed, Hampden-Smith merely teaches using ZnS:Eu, Cu, Au and Al phosphors for various hues of blue/green light and CaS:Eu for red light (see Hampden-Smith at column 36, lines 8-19). The Examiner does not even allege that Hampden-Smith teaches a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Therefore, Hampden-Smith fails to make up for the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Additionally, Applicants submit that neither Soules, Butterworth, Tsutsui, Nakamura nor Hampden-Smith, nor any combination thereof, teaches or suggests "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, neither Soules, Butterworth, Tsutsui, Nakamura nor Hampden-Smith, nor any combination thereof teaches or suggests "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

Indeed, Hampden-Smith merely teaches using ZnS:Eu, Cu, Au, and Al phosphors for various hues of blue/green light and CaS:Eu for read light (see Hampden-Smith at column 36, lines 8-19). The Examiner does not even allege that Hampden-Smith teaches an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the

adhesive layer includes a filler. Thus, Hampden-Smith fails to provide the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Therefore, Applicants submit that these references, even if combined, would not teach or suggest each and every element of the claimed invention. Therefore the Examiner is respectfully requested to withdraw these rejections.

F. The Thompson Reference

The Examiner alleges that Thompson would have been combined with Soules, Butterworth, Tsutsui and Nakamura to teach the claimed invention of claim 25. Applicants submit, however, that these references would not have been combined, and that even if combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, the Examiner's motivation to modify Soules, Butterworth, Tsutsui and Nakamura (for selectively emitting various desired colors, enabling later color readjustment or providing an assembly wherein red color is not subject to color alteration due to phosphor degradation) does not appear to be a problem in Soules, Butterworth, Tsutsui and Nakamura that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis added in MPEP).

Moreover, neither Soules, Butterworth, Tsutsui, Nakamura nor Thompson, nor any combination thereof, teaches or suggests "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of*

380nm to 500 nm" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Thompson. Indeed, the Examiner merely attempts to rely on Thompson as allegedly teaching a full-color LED assembly including two LEDs and a photoluminescent downconverter phosphor disposed for re-emission of longer wavelength light in response to light that is emitted from only one of the two LEDs. The Examiner relies upon the disclosure of Thompson to support his allegations.

Nowhere, however, in this passage (nor anywhere else for that matter) does Thompson teach or suggest a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Indeed, the Examiner does not even allege that Thompson teaches a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Therefore, Thompson fails to make up for the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Additionally, Applicants submit that neither Soules, Butterworth, Tsutsui, Nakamura nor Thompson, nor any combination thereof, teaches or suggests "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, neither Soules, Butterworth, Tsutsui, Nakamura nor Thompson, nor any combination thereof, teaches or suggests "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-

66.

Nowhere does Thompson teach or suggest an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. Indeed, the Examiner does not even allege that Thompson teaches an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. Thus, Thompson fails to provide the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Therefore, Applicants submit that these references, even if combined, would not teach or suggest each and every element of the claimed invention. Therefore the Examiner is respectfully requested to withdraw these rejections.

G. The Komoto Reference

The Examiner alleges that Komoto would have been combined with Soules, Butterworth, Tsutsui and Nakamura to teach the claimed invention of claims 46, 49 and 50. Applicants submit, however, that these references would not have been combined, and that even if combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, the Examiner's motivation to modify Soules, Butterworth, Tsutsui and Nakamura ("for increasing the versatility of the manufacturing process b[y] allowing the resultant color of a given batch to be changed to a wider array of colors") does not appear to be a problem in Soules, Butterworth, Tsutsui and Nakamura that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". "The mere fact that references can be combined or modified does not render the resultant combination

obvious unless the prior art also suggests the desirability of the combination" (emphasis added in MPEP).

Moreover, neither Soules, Butterworth, Tsutsui, Nakamura nor Komoto, nor any combination thereof, teaches or suggests "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Komoto. Indeed, the Examiner merely attempts to rely on Komoto as allegedly teaching a plurality of light emitting devices arranged in a matrix for various types of displays, that the flourescent material may be dispersed in a layer that is formed on top of a subadjacent light transmittable layer that focuses the light, and that the device may include two light transmission layers respectively including first and second materials. The Examiner relies upon column 2, lines 25 et seq. and Figures 30C and 41-46 of Komoto to support his allegations.

Nowhere, however, in this passage or these figures (nor anywhere else for that matter) does Komoto teach or suggest a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Indeed, the Examiner does not even allege that Komoto teaches a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Therefore, Komoto fails to make up for the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Additionally, Applicants submit that neither Soules, Butterworth, Tsutsui, Nakamura

nor Komoto, nor any combination thereof, teaches or suggests "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, neither Soules, Butterworth, Tsutsui, Nakamura nor Komoto, nor any combination thereof, teaches or suggests "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

Again, the Examiner merely attempts to rely on Komoto as allegedly teaching a plurality of light emitting devices arranged in a matrix for various types of displays, that the flourescent material may be dispersed in a layer that is formed on top of a subjacent light transmittable layer that focuses the light, and that the device may include two light transmission layers respectively including first and second materials. The Examiner relies on column 2, lines 25 et. seq. and Figures 30C and 41-46 of Komoto to support his allegations.

Nowhere, however, in this passage or these figures (nor anywhere else for that matter) does Komoto teach or suggest an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. Indeed, the Examiner does not even allege that Komoto teaches an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. Thus, Komoto fails to provide the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Therefore, Applicants submit that these references, even if combined, would not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is

respectfully requested to withdraw these rejections.

H. The Shimizu Reference

The Examiner alleges that Shimizu would have been combined with Soules, Butterworth, Tsutsui and Nakamura to teach the claimed invention of claims 43-45 and 63-66. Applicants submit, however, that even if these references were combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, the Examiner's motivation to modify Soules, Butterworth, Tsutsui and Nakamura ("providing greater efficiency than a SQW active layer") does not appear to be a problem in Soules, Butterworth, Tsutsui and Nakamura that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis added in MPEP).

Moreover, neither Soules, Butterworth, Tsutsui, Nakamura nor Shimizu, nor any combination thereof, teaches or suggests "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Shimizu. Indeed, the Examiner merely attempts to rely on Shimizu as allegedly teaching that it was conventionally known to provide LED groups including R, G, B and W LEDs for various conventional light purposes. The Examiner relies upon Figure 12 of Shimizu to

support his allegations.

Nowhere, however, in this figure (nor anywhere else for that matter) does Shimizu teach or suggest a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Indeed, the Examiner does not even allege that Shimizu teaches a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Therefore, Shimizu fails to make up for the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Additionally, Applicants submit that neither Soules, Butterworth, Tsutsui, Nakamura nor Shimizu, nor any combination thereof, teaches or suggests "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, neither Soules, Butterworth, Tsutsui, Nakamura nor Komoto, nor any combination thereof, teaches or suggests "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

Shimizu allegedly teaches that it was conventionally known to provide LED groups comprising R,G,B and W LEDs for various conventional light purposes. The Examiner relies on Figure 12 of Shimizu to support his allegations.

Nowhere, however, in this figure (nor anywhere else for that matter) does Shimizu teach or suggest an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. Indeed, the Examiner does not

even allege that Shimizu teaches or suggest this feature. Thus, Shimizu fails to provide the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Therefore, Applicants submit that these references, even if combined, would not teach or suggest each and every element of the claimed invention. Therefore the Examiner is respectfully requested to withdraw these rejections.

I. The Chiyo Reference

The Examiner alleges that Chiyo would have been combined with Soules, Butterworth, Tsutsui and Nakamura to teach the claimed invention of claims 51-58. Applicants submit, however, that even if these references were combined, the combination would not teach or suggest each and every element of the claimed invention.

That is, the Examiner does not provide a motivation to modify Soules, Butterworth, Tsutsui and Nakamura as suggested above. The Examiner merely states that GaInN MQWs were conventionally known at the time of the invention for emitting blue light. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis added in MPEP).

Moreover, neither Soules, Butterworth, Tsutsui, Nakamura nor Chiyo, nor any combination thereof, teaches or suggests "*a primary light source comprising a GaN semiconductor light-emitting device that emits a first light of substantially the entire range of 380nm to 500 nm*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, 42 and 63-66.

The novel combination of features of the claimed invention is not taught or suggested by Chiyo. Indeed, the Examiner merely attempts to rely on Chiyo as allegedly teaching that the blue-emitting LED active region may be composed of InGaN MQWs. The Examiner relies upon column 12, lines 57-65 of Chiyo to support his allegations.

Nowhere, however, in this figure (nor anywhere else for that matter) does Chiyo teach or suggest a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Indeed, the Examiner does not even allege that Chiyo teaches a primary light source including a GaN semiconductor light-emitting device that emits a first light having a wavelength of 380 nm to 500 nm. Therefore, Chiyo fails to make up for the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Additionally, Applicants submit that neither Soules, Butterworth, Tsutsui, Nakamura nor Chiyo, nor any combination thereof, teaches or suggests "*wherein said multiple quantum well structure comprises well layers comprised of InGaN*" as recited in exemplary dependent claim 22, and similarly recited in claims 54, 56, 58 and 63-66.

Furthermore, neither Soules, Butterworth, Tsutsui, Nakamura nor Chiyo, nor any combination thereof teaches or suggests "*an adhesive layer for securing said light-emitting device in said cup portion of said lead frame, said adhesive layer comprising a filler*" as recited in independent claim 1, and similarly recited in independent claims 11, 21, and 42.

The Examiner merely relies on Chiyo as allegedly teaching that the blue-emitting LED active region may be composed of InGaN MQWs. The Examiner relies on column, lines 57-65 of Chiyo to support his allegations.

However, Chiyo fails to teach or suggest an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler.

Indeed, the Examiner does not even allege that Chiyo teaches an adhesive layer for securing the light-emitting device in the cup portion of the lead frame, where the adhesive layer includes a filler. Thus, Chiyo fails to provide the deficiencies of Soules, Butterworth, Tsutsui and Nakamura.

Therefore, Applicants submit that these references, even if combined, would not teach or suggest each and every element of the claimed invention. Therefore the Examiner is respectfully requested to withdraw these rejections.

IV. NEW CLAIMS

New claims 67-85 are added to provide more varied protection for the present invention and to claim additional features of the invention. The claims are independently patentable because of the novel features recited therein.

Applicants respectfully submit that new claims 67-85 are patentable over any combination of the applied references at least for analogous reasons to those set forth above with respect to claims 1-3, 6-13, 16-22, 25-28, 30-34, 38-46 and 49-66.

V. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicants submit that claims 1-3, 6-13, 16-22, 25-28, 30-34, 38-46, and 49-85, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed

below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: March 10, 2005

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